

CLAIMS

1. A multiple compression coding method in which an input signal feeds in parallel a plurality of coders each including a succession of functional units with a view to
5 compression coding of said signal by each coder, which method is characterized in that it includes the following preparatory steps:

- a) identifying the functional units forming each coder and one or more functions implemented by each unit;
- 10 b) marking functions that are common from one coder to another; and
- c) executing said common functions once and for all for at least some of the coders in a common calculation module.

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2. A method according to claim 1, characterized in that said calculation module consists of one or more functional units of one of the coders.

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3. A method according to claim 2, characterized in that, for each function executed in step c), at least one functional unit is used of a coder selected from said plurality of coders and the functional unit of said coder selected is adapted to deliver partial results to the
25 other coders, for efficient coding by said other coders verifying an optimum criterion between complexity and coding quality.

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4. A method according to claim 3, wherein the coders are liable to operate at respective different bit rates, characterized in that the coder selected is the coder with the lowest bit rate and the results obtained after execution of the function in step c) with parameters specific to the selected coder are adapted to the bit
35 rates of at least some of the other coders by a focused parameter search for at least some of the other modes up to the coder with the highest bit rate.

5. A method according to claim 3, wherein the coders are adapted to operate at respective different bit rates, characterized in that the coder selected is the coder with the highest bit rate and the results obtained after execution of the function in step c) with parameters specific to the selected coder are adapted to the bit rates of at least some of the other coders by a focused parameter search for at least some of the other modes up to the coder with the lowest bit rate.

6. A method according to claim 4 in combination with claim 5, characterized in that the functional unit of a coder operating at a given bit rate is used as the calculation module for that bit rate and at least some of the parameters specific to that coder are progressively adapted:

- up to the coder with the highest bit rate by focused searching; and
- up to the coder with the lowest bit rate by focused searching.

7. A method according to claim 1, wherein the functional units of the various coders are arranged in a trellis with a plurality of possible paths in the trellis, characterized in that each path in the trellis is defined by a combination of operating modes of the functional units and each functional unit feeds a plurality of possible variants of the next functional unit.

8. A method according to claim 7, characterized in that a partial selection module is provided after each coding step conducted by one or more functional units capable of selecting the results supplied by one or more of those functional units for subsequent coding steps.

9. A method according to claim 7, wherein the functional units are liable to operate at respective different bit rates using respective parameters specific to said bit rates, characterized in that, for a given functional unit, the path selected in the trellis is that passing through the lowest bit rate functional unit and the results obtained from said lowest bit rate functional unit are adapted to the bit rates of at least some of the other functional units by a focused parameter search for at least some of the other functional units up to the highest bit rate functional unit.

10. A method according to claim 7, wherein the functional units are liable to operate at respective different bit rates using respective parameters specific to said bit rates and characterized in that, for a given functional unit, the path selected in the trellis is that passing through the highest bit rate functional unit and the results obtained from said highest bit rate functional unit are adapted to the bit rates of at least some of the other functional units by a focused parameter search for at least some of the other functional units up to the lowest bit rate functional unit.

11. A method according to claim 9 in combination with claim 10, characterized in that, for a given bit rate associated with the parameters of a functional unit of a coder, the functional unit operating at said given bit rate is used as the calculation module and at least some of the parameters specific to that functional unit are progressively adapted:

- up to the functional unit capable of operating at the lowest bit rate by focused searching; and
- up to the functional unit capable of operating at the highest bit rate by focused searching.

12. A method according to claim 1, characterized in that said calculation module is independent of said coders and is adapted to redistribute results obtained in step c) to all the coders.

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13. A method according to claim 12 in combination with claim 2, characterized in that the independent module and the functional unit or units of at least one of the coders are adapted to exchange results obtained in step c) with each other and the calculation module is adapted to effect adaptation transcoding between functional units of different coders.

14. A method according to either claim 12 or 13, characterized in that the independent module includes an at least partial coding functional unit and an adaptation transcoding functional unit.

15. A method according to any one of the preceding claims, wherein the coders in parallel are adapted to operate multimode coding and characterized in that an *a posteriori* selection module is provided capable of selecting one of the coders.

16. A method according to claim 15, characterized in that a partial selection module is provided that is independent of the coders and able to select one or more coders after each coding step conducted by one or more functional units.

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17. A method according to any one of the preceding claims, wherein the coders are of the transform type and characterized in that the calculation module includes a bit assignment functional unit shared between all the coders, each bit assignment effected for one coder being followed by an adaptation to that coder, in particular as a function of its bit rate.

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18. A method according to claim 17, characterized in that the method further includes a quantization step the results whereof are supplied to all the coders.

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19. A method according to claim 18, characterized in that it further includes steps common to all the coders including:

- a time-frequency (MDCT) transform;
- 10 • detection of voicing in the input signal;
- detection of tonality;
- determination of a masking curve; and
- spectral envelope coding.

15 20. A method according to claim 17, wherein the coders effect sub-band (MPEG-1) coding, characterized in that the method further includes steps common to all the coders including:

- application of a bank of analysis filters;
- 20 • determination of scaling factors;
- spectral transform (FFT) calculation; and
- determination of masking thresholds in accordance with a psycho-acoustic model.

25 21. A method according to any one of claims 1 to 16, wherein the coders are of the analysis by synthesis (CELP) type and characterized in that the method includes steps common to all the coders including:

- preprocessing;
- 30 • linear prediction coefficient analysis;
- weighted input signal calculation; and
- quantization for at least some of the parameters.

35 22. A method according to claim 21 in combination with claim 16, characterized in that the partial selection module is used after a split vector quantization step for short-term (LPC) parameters.

23. A method according to claim 21 in combination with claim 16, characterized in that the partial selection module is used after a shared open loop long-term parameter (LTP) search step.

24. A software product adapted to be stored in a memory of a processor unit, in particular of a computer or a mobile terminal, or in a removable memory medium adapted to cooperate with a reader of the processor unit, characterized in that it includes instructions for implementing the transcoding method according to any one of the preceding claims.

25. A system for assisting multiple compression coding in which an input signal feeds in parallel a plurality of coders each including a succession of functional units, for the purposes of compression coding of said signal by each coder, characterized in that it includes a memory adapted to store instructions of a software product according to claim 24.

26. A device according to claim 25, characterized in that it further includes an independent calculation module (MI) for implementing the method according to any one of claims 12 to 16, 22 and 23.